

intermediate elements including the cut-out for adjusting the length of the static mixture" is new matter. Also, the original specification nowhere suggests that "machining access" is provided when the mixer is assemble (sic). Any cut-out in a given structural element is filled by protrusions of another element, when the mixer is assembled as claimed. (Rejection, Paragraph 5)

First, applicants respectfully submit that the specification does in fact "describe machining to adjust the length of an assembled mixer." Turning to page 2, paragraph [16] it is stated:

The static mixer contains precision cast elements which are arranged along a central axis and which in each case have a reinforcement region at their circumference which extends over the entire circumference. These cast elements are assembled with intermediate elements to form a cylindrical body. Joint locations between the elements form surfaces which stand transversely to the central axis. For each isolated cast element, in a rotation about its central axis, the joint locations are accessible to machining tools for subsequent machining—in particular for grinding or turning. As a result of the subsequent machining a predetermined total length of the mixer in the direction of the central axis can be precisely achieved. (Emphasis added)

It is submitted that the machining is more than adequately described. One having ordinary skill in the art would understand that grinding or turning of a surface having a protuberance would be literally impossible. However, grinding or turning of a

surface having a cut-out is infinitely easier. By redesigning the continuous joint surfaces for machining at surfaces having cut-outs only, the precision length adjustment is achieved.

Second, the rejection assumes that "Any cut-out in a given structural element is filled by protrusions of another element, when the mixer is assembled as claimed." This is true only in part. The projections 21, 21' and 22, 22' only partially fill the cut-outs 41, 41' and 42, 42'. In fact the specification sets forth at page 5 in the first full paragraph of the page at lines 7 through 10 the following statement:

The elements 1 and 2 are in contact at joint locations which are formed by ring-shaped surfaces 40a, 40b of the reinforcing ring 4 and ring-shaped surfaces 20a, 20b (see Fig. 3) of the intermediate elements 2. These surfaces 40a, 40b and 20a, 20b form the only joint locations. (Emphasis added)

Simply stated, the projections 21, 21' and 22, 22' do not form joint locations. Therefore when the surfaces 40a, 40b are machined or turned, the projections can extend further into the cut-outs without themselves being machined.

It is respectfully requested that the objection under 35 USC 112, first paragraph, be withdrawn.

Action on the Merits

The rejection has cited as a new reference Streiff U.S. Patent 6,394,644. In light of the above explanation, it is believed that this reference does not anticipate or render obvious the invention as now claimed. Applicants will first summarize the invention as claimed. Thereafter, Streiff will be distinguished.

Claimed Invention Summarized

The invention relates to a static mixer. Precision cast static mixer elements (1) are arranged along a central axis (10), each precision cast static mixer element having a circumferential reinforcement region (4).

Intermediate elements (2) abut this circumferential reinforcement region (4) and form in combination with the precision cast static mixer elements a static mixer body of preselected length with a periphery defined by the reinforcement region and the intermediate elements.

Joints between the reinforcement region (4) and the intermediate elements (2) define continuous joint surfaces (40a, 40b and 20a, 20b). A seal is formed between the continuous joint surfaces between the reinforcement regions (4) and the intermediate elements (2).

Stopping here, it should be realized that the configurations of the circumferential reinforcement region (4) and of the intermediate elements (2) are reversible. In the example shown, protrusions 21, 21' and 22, 22' happen to be on the intermediate elements (2) with cut-outs 41, 41' and 42, 42' on the circumferential reinforcement regions (4). The protrusions could just as well be on the reinforcement regions (4) with the cut-outs on the intermediate elements (2).

Realizing this reversibility, one continuous joint surface includes a cut-out.

The other continuous joint surface includes a protrusion for extending into (but not sealing) the cut-outs. It has the function of rotationally positioning the reinforcement regions and the intermediate elements at the seal of the continuous joint surfaces with respect to each other.

It is here that the utility of the invention is realized. The continuous joint surface including the cut-out provides an upwardly extending sealing surface unobstructed by a protrusion. This enables machining access by grinding or turning for precision adjustment of the length of the static mixer.

Streiff Distinguished

In order to understand Streiff U.S. Patent 6,394,644, it is necessary to briefly review Signer U.S. Patent 5,564,827, the reference upon which this disclosure improves. In the Signer reference, stacked static mixer elements 4 are placed between sleeve members 5. A system of bosses 45 and corresponding recesses 54 is used to key the respective static mixer elements 4 and sleeve members 5 together. This provided a system of static mixer devices that were generally accessible for maintenance and cleaning and visual inspection after use.

Streiff recognizes a serious drawback of this device. Recognizing that Signer is PCT publication number W095/09689, Streiff states at column 1, lines 34 to 44:

It is also desired that static mixer devices must generally be accessible for maintenance and cleaning and visual inspection after use. One previously known method to provide access permitting cleaning and inspection is to support individual elements with a satellite type ring as is shown in International Publication WO 95/09689. This construction, however, requires expensive precision casting and costly machined spacer rings. (Emphasis added)

It is the purpose of applicants' invention to do away with the "costly machined spacer rings."

Streiff U.S. Patent 6,394,644 is not at all concerned with spacer rings. First, and viewing Streiff at Fig.5, the static mixer has an outer seal constituting a pipe 62. It is into this pipe 62 that the individual elements 10a, 10b, 10c and 10d of the static mixer are placed.

This disclosure contains no equivalent of the pipe 62. Instead, reinforcement regions (4) and intermediate elements (2) form the seal for the static mixer.

Streiff does have static mixer elements surrounded by edge surfaces. The surfaces appear at edge surfaces 22 (see Fig. 2, and Fig. 6A) and edge surfaces 24 (see

Fig. 3 and Fig. 6B). However, it has no equivalent of applicants' intermediate elements (2). Each of the elements 10a, 10b, 10c and 10d are static mixer elements.

Thus the rejection equates some of the static mixer elements, say 10a and 10c, to intermediate elements (2) and others of the static mixer elements, say 10b and 10d, to precision cast static mixer elements (4).

If this assumption is made, it is instructive to turn to Figs. 6A, 6B and 6C of Streiff. As the rejection correctly notes, protrusions and cut-outs appear. However, protrusions 82, 83 interrupt the entire surfaces 22, 24. Similarly, cut-outs 81 interrupt the entire surfaces 22, 24. If one were to adjust the length of these mixer elements placed one upon another, one would have to machine both protrusions 82, 83 and cut-outs 81. To preserve a seal between the cut-outs 81 and protrusions 82, 83, the machining of the protrusions and cut-outs would have to be precisely equal. Machining that is other than precisely equal would cause a leakage between the surfaces 22, 24, especially where the cut-outs 81 and protrusions 82, 83 mate. Further, as one can plainly see, machining at the base of the protrusions 82, 83 would require excruciating care to prevent leakage.

Compared to the machining of a single flat surface as set forth in this disclosure, the Streiff arrangement is incredibly laborious. This is why the successive mixer elements are loaded into pipe 62. The disclosure herein does not require the equivalent of pipe 62.

For the above reasons allowability is earnestly solicited.

CONCLUSION

In view of the foregoing, applicants believe all claims now pending in this application are in condition for allowance and an action to that end is urged. If the Examiner believes a telephone conference would aid in the prosecution of this case in any way, please call the undersigned at 415-576-0200.

Respectfully submitted,

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PATENT

VERSION WITH MARKINGS TO SHOW CHANGES MADE

11. (Once Amended)~~[(New)]~~ A static mixer comprising:
precision cast static mixer elements (1) arranged along a central axis (10),
each precision cast static mixer element having a circumferential reinforcement region
(4);

intermediate elements (2) abutting the circumferential reinforcement
region (4) and forming in combination with the precision cast static mixer elements a
static mixer body of a preselected length with a periphery defined by the reinforcement
region and the intermediate elements; and

joints between the reinforcement region (4) and the intermediate elements
(2) defining continuous joint surfaces (40a, 40b and 20a, 20b) and a seal formed between
the continuous joint surfaces between the reinforcement regions (4) and the intermediate
elements (2);

~~[the]one~~ continuous joint ~~[surfaces of one of the reinforcement region and~~
~~the intermediate elements]~~surface including a cut-out~~[-and-]~~;

the other ~~[one of the reinforcement region and the intermediate~~
~~elements]~~continuous joint surface including a protrusion for extending into the cut-outs
for positioning the reinforcement region and the intermediate elements at the seal of the
continuous joint surfaces with respect to each other~~[-to provide]~~;

the continuous joint surface including the cut-out providing an upwardly
extending sealing surface unobstructed by a protrusion to enable machining access ~~[to the~~
~~one of the reinforcement region and the intermediate elements including the cut-out]~~for
adjusting the length of the static mixer.